FlyBy Math™ Alignment
California Mathematics Content Standards

Algebra and Functions

1.0 Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs:

Mathematics Content Standard	FlyBy Math™ Activities
1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.

3.0 Students graph and interpret linear and some nonlinear functions:

Mathematics Content Standard	FlyBy Math™ Activities
3.3 Graph linear functions, noting that the vertical change (change in y-value) per unit of horizontal change (change in x-value) is always the same and know that the ratio ("rise over run") is called the slope of a graph.	--Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system. --Interpret the slope of a line in the context of a distance-rate-time problem.
3.4 Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities.	--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes. --Interpret the slope of a line in the context of a distance-rate-time problem.

4.0 Students solve simple linear equations and inequalities over the rational numbers:

Mathematics Content Standard	FlyBy Math™ Activities
4.2 Solve multistep problems involving rate, average speed, distance, and time or a direct variation.	-- Use the distance-rate-time formula to predict and analyze aircraft conflicts.

Measurement and Geometry

1.0 Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems:

Mathematics Content Standard	FlyBy Math™ Activities
1.2 Construct and read drawings and models to scale.	-- Conduct simulation and measurement for several aircraft conflict problems.

	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.
1.3 Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g. person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation. -- Use the distance-rate-time formula to predict and analyze aircraft conflicts. --Predict outcomes and explain results of mathematical models and experiments.

Mathematical Reasoning

1.0 Students make decisions about how to approach problems:

Mathematics Content Standard	*FlyBy Math*[TM] Activities
1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.	--Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
1.2 Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	--Predict the relative motion of two airplanes on given paths --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

2.0 Students use strategies, skills, and concepts in finding solutions:

Mathematics Content Standard	*FlyBy Math*[TM] Activities
2.1 Use estimation to verify the reasonableness of calculated results.	--Predict the relative motion of two airplanes on given paths.
2.2 Apply strategies and results from simpler problems to more complex problems.	--Compare airspace scenarios for both the same and different starting conditions and the same and different rates.
2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. --Predict outcomes and explain results of mathematical models and experiments.
2.5 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. --Predict outcomes and explain results of mathematical models and experiments.

	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
2.6 Express the solution clearly and logically using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system. --Predict outcomes and explain results of mathematical models and experiments.
2.8 Make precise calculations and check the validity of the results from the context of the problem.	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation. --Predict outcomes and explain results of mathematical models and experiments. --Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.

3.0 Students move beyond a particular problem by generalizing to other situations:

Mathematics Content Standard	*FlyBy Math*^{TM} Activities
3.1 Evaluate the reasonableness of the solution in the context of the original situation.	--Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.	--Predict outcomes and explain results of mathematical models and experiments. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
3.3 Develop generalizations of the results obtained and apply them in other circumstances.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.